

CLAIMS

1. A high frequency magnetic thin film comprising:
a first layer comprising a T-L composition (here, T is Fe or FeCo, L is one or more of C, B and N); and
a second layer comprising a Co-based amorphous alloy arranged on either of the surfaces of said first layer.
2. A high frequency magnetic thin film according to claim 1, wherein:
a plurality of said first layers and a plurality of said second layers are laminated to form a multilayer film structure.
3. A high frequency magnetic thin film according to claim 1 or 2, wherein:
the real part (μ') of the complex permeability at 1 GHz is 400 or more,
the quality factor Q (μ'/μ'') is 4 or more, and
the saturation magnetization is 14 kG (1.4 T) or more.
4. A high frequency magnetic thin film according to claim 3, wherein:
when T1 denotes the thickness of said first layer and T2 denotes the thickness of said second layer, T1 falls within the range from 3 to 70 nm and T1/T2 falls within the range from 0.15 to 3.50.

5. A high frequency magnetic thin film according to claim 1 or 2, wherein:

the real part (μ') of the complex permeability at 1 GHz is 500 or more,

the quality factor Q (μ'/μ'') is 10 or more, and

the saturation magnetization is 14 kG (1.4 T) or more.

6. A high frequency magnetic thin film according to claim 5, wherein:

when T_1 denotes the thickness of said first layer and T_2 denotes the thickness of said second layer, the thickness of said first layer T_1 falls within the range from 0.5 to 3.0 nm and T_1/T_2 falls within the range from 0.8 to 3.0.

7. A high frequency magnetic thin film according to any one of claims 1 to 6, wherein:

said second layer is mainly composed of Co, and comprises at least one additional element selected from the group consisting of B, C, Si, Ti, V, Cr, Mn, Fe, Ni, Y, Zr, Nb, Mo, Hf, Ta and W.

8. A high frequency magnetic thin film according to any one of claims 1 to 7, wherein:

said second layer is selected from the group consisting of CoZr, CoHf, CoNb, CoMo, CoZrNb, CoZrTa, CoFeZr, CoFeNb, CoTiNb, CoZrMo, CoFeB, CoZrNbMo, CoZrMoNi, CoFeZrB, CoFeSiB and CoZrCrMo.

9. A high frequency magnetic thin film according to any one of claims 1 to 8, wherein:

the concentration of the element L contained in said first layer falls within the range from 2 to 20 at%.

10. A composite magnetic thin film, comprising:

a first layer which is mainly composed of Fe or FeCo, with the saturation magnetization of 16 kG (1.6 T) or more by itself, and said first layer is constituted with a columnar structure of 1.4 or less aspect ratio or an amorphous structure, and

a second layer which is mainly composed of Co, having the properties by itself that the permeability is 1,000 or more (the measurement frequency: 10 MHz), the saturation magnetization is 10 kG (1.0 T) or more, and the resistivity is 100 $\mu\Omega$ cm or more, wherein:

said first layer and said second layer are alternately laminated.

11. A magnetic device comprising a high frequency magnetic thin film, wherein:

said high frequency magnetic thin film is a multilayer film wherein a first layer comprising a T-L composition (here, T is Fe or FeCo, L is one or more of C, B and N) and a second layer comprising a Co-based amorphous alloy arranged on either of the surfaces of said first layer are alternately laminated.

12. A magnetic device according to claim 11, wherein:
said magnetic device comprises said high frequency
magnetic thin films arranged to face each other so as to sandwich
a coil.

13. A magnetic device according to claim 12, wherein said
magnetic device is an inductor or a transformer.

14. A magnetic device according to claim 12, wherein:
said magnetic device is an inductor used in a monolithic
microwave integrated circuit.